

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

1. (Previously presented) A process for irradiating products by means of a high energy X-ray beam source in an installation having an irradiation chamber, said process comprising the steps of:

determining the density of the products to be irradiated,
in order to irradiate said products as a stack, predetermining, on the basis of said density, the optimal size of the product stack able to optimize the throughput of the installation and/or the dose uniformity ratio (DUR),

in the irradiation chamber, loading products as a stack of said optimal size onto rotation means located in front of the X-ray beam source,

while rotating the rotation means around a rotation axis, irradiating said products from a lateral side of said product stack without using a collimator wherein said steps are controlled by a controlling means.

2. (Previously presented) The process according to claim 1, wherein the rotation speed of the rotation means in front of the X-ray beam source is maintained constant.

3. (Previously presented) The process according to claim 2, wherein the rotation speed of the rotation means in front of the radiation beam source is maintained constant by the action of the controlling means at a value depending upon predefined parameters.

4. (Previously presented) The process according to claim 1, wherein the products are carried on pallets and the stack is formed by at least two contiguous pallets.

5. (Previously presented) The process according to claim 4 wherein the stack comprises at least four product pallets.

6. (Previously presented) The process according to claim 1 wherein the pallets in the stack are in a plane perpendicular to the rotation axis of the rotation means.

7. (Previously presented) The process according to claim 5 wherein the four product pallets to be irradiated are rectangular product pallets and form together a square base with an open column at the centre of the square base.

8. (Previously presented) The process according to claim 7, wherein the centre of the square coincides with the rotation axis of the rotation means.

9. (Previously presented) The process according to claim 5 wherein the four product pallets to be irradiated are rectangular pallets having each at least one corner, and said four product pallets are arranged in such a way that said corner of each pallet coincides in a contact point with one corner of the other three pallets.

10. (Previously presented) The process according to claim 9 wherein the contact point is located on the rotation axis of the rotation means.

11. (Previously presented) The process according to claim 1, adapted for irradiating products under bulk form or under the form of small parcels, wherein the product stack is maintained in at least one cylindrical container having an internal volume.

12. (Previously presented) The process according to claim 11, wherein said products are arranged in said cylindrical container so as to fill the total internal volume of said cylindrical container.

13. (Previously presented) The process according to claim 11, wherein said products are arranged in said cylindrical container so as to let an open column along the center axis of the cylindrical container.

14. (Previously presented) The process according to claim 11, wherein said cylindrical container is selected from a set of cylindrical containers consisting of mortars and cylindrical baskets, said cylindrical containers having a diameter near to said determined optimal size.

15. (Previously presented) The process according to claim 1, wherein the irradiation of the products is performed by batches of products of similar densities.

16. (Previously presented) An apparatus for irradiating products, said apparatus comprising:

a high energy X-ray beam source, for irradiating the products from a lateral side with a beam directed along a first direction substantially perpendicular to said lateral side, and scanned along a second direction substantially perpendicular to said first direction,

an irradiation chamber, where irradiation of the products can be performed, said irradiation chamber comprising rotation means for rotating said products around a rotation axis parallel to said second direction,

said rotating taking place in front of said X-ray beam source at a constant rotation speed, during irradiation, said rotation means comprising means for receiving the products;

wherein said apparatus does not comprise a collimator, and said means for receiving the products are adapted to receive products loaded thereon as a stack the size of which is variable depending on the density of said product,

wherein said apparatus is adapted to receive a product stack comprising products carried on pallets,

wherein the product stack comprises at least four contiguous pallets,

wherein that at least four product pallets to be irradiated are rectangular pallets having each at least one corner and said four product pallets are arranged in such a way that said corner of each pallet coincides in a contact point with one corner of the other three pallets,

and wherein the contact point is located on the rotation axis of the rotation means.

17- 31. (Canceled).

32. (New) An apparatus for irradiating products, said apparatus comprising:
a high energy X-ray beam source, for irradiating the products from a lateral side with a beam directed along a first direction substantially perpendicular to said lateral side, and scanned along a second direction substantially perpendicular to said first direction,

an irradiation chamber, where irradiation of the products can be performed, said irradiation chamber comprising rotation means for rotating said products around a rotation axis parallel to said second direction,

said rotating taking place in front of said X-ray beam source at a constant rotation speed, during irradiation, said rotation means comprising means for receiving the products;

wherein said apparatus does not comprise a collimator, and said means for receiving the products are adapted to receive products loaded thereon as a stack the size of which is variable depending on the density of said products,

wherein said apparatus is adapted to receive a product stack comprising products carried on one or more pallets, wherein each of said one or more product pallets to be irradiated comprises one corner and a contact point and said contact point is located on the rotation axis of the rotation means and the corner and contact point of said one or more product pallets coincides.